The door in the middle of this southern wall on the main floor opens into a large closet, a store-room for glassware. The remaining door leads to a set of smaller rooms under the gallery of the lecture-room, intended for special work, and to be more fully fitted up at some future time, or as the needs of investigation shall make desirable.

Under the seats and openings into two of these small rooms are closets, dotted in the plan, which are convenient places for storage. The first of these rooms is known as the 'weighing-room.' It contains a delicate balance (*Bl*) on a firm shelf, and a Wiedemann's galvanometer (*Gm*) fixed on a pier near the door. The telescope (*Tl*) of the latter is attached to a column in the centre of the room. In the corner is a small refrigerator (*R*) with a waste-pipe. This room, as well as its neighbors, has water, gas, and wires from the tower. The next, or 'dark room,' has no windows, and is intended for optical experiments, or for any work requiring the exclusion or perfect control of daylight. A shutter near the door to the south permits any arrangement of diaphragms and lenses which can possibly be called for. At some future time a Thomson galvanometer will be set up in this room.

The corner room, known as the 'light-room,' has no special purpose, but is to be used for such work as may require a very good light and perfect quiet. The position of this room, in the corner of the building farthest removed from the streets, is very favorable for uninterrupted, quiet investigation. In one corner is the 'photograph-room' for the preparation and development of the plates. Against the wall, in the opposite corner, a pendulum myograph (*PM*) is fastened permanently in position, and covered by a dust-proof case. This is the instrument made by Dr. J. J. Putnam, and described by him in the *Journal of physiology* (ii. p. 206). Wires run from this apparatus to the adjoining closet,—an arrangement that is found convenient for experiments with reaction time. One of the southern windows of the light-room has also a broad heliostat shelf (*HS*) outside, so that a beam of light may be sent even into the assistant's room, or, by a suitable disposition of mirrors, into any part of any other room. The remaining door of the light-room opens upon a passage-way which leads to the chemical laboratories, and makes the departments independent of the main hall or the lecture-room for communication.

KRAKATOA.

THE more the information accumulates with regard to the eruption of Krakatoa on Aug. 27, 1883, the more this phenomenon proves to have been remarkable and unique as a series of violent explosions.

From *Nature* of July 17 we learn, that, at the meeting of the Meteorological society of Mauritius on May 22, several interesting communications were made with regard to this eruption; among others, a letter from a M. Lecomte, dated at Diego Garcia (latitude 7° 20′ south, longitude 72° 35′ east of Greenwich) on April 24, describing how at breakfast, on the morning of Aug. 27, they had heard detonations, low but violent, and, attributing them to a vessel in distress, had run, and had sent men, to different points of the shore of the island, who were unable to see any thing to cause such sounds; also how the captain and mate of the Eva Joshua, just leaving Pointe de l'Est to anchor at Pointe Marianne (these places I cannot find, but suppose, from the account, that they are near Diego Garcia), had heard the same detonations, and sent men to the mastheads, without seeing any thing. These, with the previous reports from Rodriguez, showed that in three distinct cases the sounds of the Krakatoa explosions were plainly heard at distances of at least twenty-two hundred miles, and, in the case of Rodriguez, of nearly three thousand.

It will be remembered, that in *Nature*, May 1, it was stated by Herr R. D. M. Verbeek that these sounds were heard in Ceylon, Burmah, Manila, New Guinea, and at Perth on the west coast of Australia, and, in fact, at all places within a radius of about 30°, or two thousand miles. But these later reports from Rodriguez and Diego Garcia show, that across the waters of the Indian Ocean, with no land intervening, they were carried distinctly to much greater distances.

The still more remarkable atmospheric gravity-waves which travelled round and round the globe in all directions from the Straits of Sunda, and which were fortunately registered on the self-recording pressure-guage of the large gasometer at Batavia, close by Krakatoa, were also registered on the barograms at Mauritius; and here there were distinctly recorded four successive transits of the waves from east to west, and three from west to east, the same as shown by Gen. Strachey to have occurred at some of the European stations. But, what is still more remarkable, there is a faint trace of a *fifth* transit of the waves from east to west on the morning of Sept. 2; i.e., *more than six days after the explosions*, and when the waves had travelled *more than four times round the earth*, or about a hundred and two thousand miles. The most sensitive barograph at the signal-office in Washington also shows small waves, which are probably the record, also, of this fifth transit (and barely possibly of the succeeding *sixth* transit of the same): but the phenomena at Washington are complicated by the fact that it is within about 33° of the antipodes of Krakatoa, and that the waves have different velocities east and west,

and also that the great circle through Krakatoa and Washington passes nearly over the poles, and in this direction the velocity seems to be still smaller; so that the phenomena for this region become more and more complicated for each succeeding transit, and, after the first two or three in each direction, rather difficult to unravel. Unfortunately, the other few barographs in use on this side the Atlantic — to all of which the great circles from Krakatoa take an entirely different direction from that to all the eastern stations — are not so sensitive as the best Washington barograph, and do not help much beyond the first two transits of the waves in each direction.

It is noteworthy that these barometric disturbances were first noticed at Mauritius early in September, soon after their occurrence, and were at once independently attributed to the Krakatoa eruption, but were supposed to be due to successive series of explosions day after day, until the publication long after, in *Nature*, Dec. 20, of the discovery of Mr. Scott and Gen. Strachey, showed them to be due to a single series of waves, travelling round and round the globe, from the explosions of Aug. 27.

Perhaps the most interesting and important fact appearing from these Mauritius records, in connection with these waves, is the difference in time of transit round the earth, as compared with that deduced from the European stations by Gen. Strachey. The paths of the waves from Krakatoa to the latter stations are, on the average, something like 40° north of west (from Krakatoa), and, to Mauritius, about 20° south of west; so that the great circles make an angle of about 60°. The difference in time of transit on these circles, and in the two directions on each, are best shown in the table below, where, following Gen. Strachey's nomenclature, the successive waves are numbered from i. to vii., and the odd numbers denote the transits from east to west, and the even those from west to east.

	i. to iii.	iii. to v.	v. to vii.	Mean.	ii. to iv.	iv. to vi.	Mean.
	S. E. to N. W.				N. W. to S. E.		
European . . .	*h. m.* 37 4	*h. m.* 36 54	*h. m.* 36 48	*h. m.* 36 57	*h. m.* 35 24	*h. m.* 35 9	*h. m.* 35 17
	N. E. to S. W.				S. W. to N. E.		
Mauritius . . .	*h. m.* 34 34	*h. m.* 34 37	*h. m.* 34 43	*h. m.* 34 38	*h. m.* 35 15	*h. m.* 36 13	*h. m.* 35 44

Of course, all the above numbers are liable to an uncertainty of several minutes; but, even when this is considered, the differences are quite marked. While the average time of transit *via* Europe is 1m. - 40m. *greater* going west than going east, *viâ* Mauritius it is 1h. 6m. *less;* indicating, as far as atmospheric currents are concerned, an opposite effect on these two great circles, which make, roughly, an angle of 60° with each other. The peculiar progression in the individual periods for successive transits can hardly be wholly accidental, and is in opposite directions; the waves *viâ* Europe going (in each direction) faster and faster, and *viâ* Mauritius being retarded. Perhaps the most striking difference is, that the mean period, regardless of direction, is nearly 1 h. less *viâ* Mauritius than *viâ* Europe, — a fact most strikingly shown by taking the whole interval vii.–i., which, for the five European stations where vii. was traced, gives 110 h. 50 m., and, for Mauritius, 103 h. 54 m.; showing the wave to have gone three times round the earth *seven hours quicker viâ* the more equatorial route, which is probably partly due to the higher temperature of the atmosphere along this path, and also, perhaps, to the fact that this great circle passes over about as little land as any that can be drawn through Krakatoa.

These facts show more forcibly how complicated the phenomena must have been near the antipodes of Krakatoa, and also at the latter place, upon the returns of the waves there. It is evident, that, when the Krakatoa committee of the Royal society shall have collected all the data, many interesting problems will arise in connection with these atmospheric waves; and, in connection with the distribution of Krakatoa dust by the upper currents (which, it may now be regarded as pretty well settled, was the cause of the wide-spread red-sunset phenomena), the explosive eruption of Krakatoa promises, if thoroughly investigated, to teach us more about the circulation of our atmosphere than years of ordinary meteorological study could have done. H. M. PAUL.

Washington, July 29.

OVERWORK IN GERMAN SCHOOLS.

AFTER forty-two years' experience, it is now virtually conceded in Germany that physical exercise is not a sufficient antidote to brain-pressure, but that where the evil exists, the remedy must be sought in the removal of the cause.

Official action with reference to over-pressure has been taken in Prussia, Saxony, Würtemberg, Baden, Hesse, and Alsace Lorraine. In each instance it is based upon the report of a commission of inquiry, consisting of school directors, and members of school boards, as well as physicians.

The official action based upon the reports of the commissions is embodied in decrees dealing with the scope and method of teaching, the number and hours of study in school, and the amount of home-study.

The Hessian government issued decrees about home-study in 1877, and again in 1881. Complaints of overwork increasing, a commission was appointed to make further investigation, and report in full. Their recommendations were, in the main, embodied in the decrees of Feb. 23, 1883. By these decrees a maximum of home-study was fixed for each class, amounting for the lowest classes to an hour a day; the quantity of Latin and Greek required was diminished; and all tests of the student's progress that